



M.O.E. Policy Manual

POLICY TITLE COMBUSTION IN INCINERATORS		NO. 01-01-01
<u>Legislative Authority</u> The Environmental Protection Act Regulation 308 Regulation 309		
<u>Statement of Principles</u> This policy is designed to reduce contaminant emissions from incinerators by properly controlling the combustion process, and thereby contribute to the protection of the environment. The policy establishes minimum design and operating parameters for the evaluation of new incinerators that burn one or a combination of domestic, biomedical, commercial or non-hazardous solid industrial wastes. Minimum design and operating parameters for crematoria are outlined in Policy 01-05. The elements of this policy should also be considered when evaluating existing incinerators, and assessing proposals for upgrading existing units. Incinerators which meet the requirements of this policy will achieve high combustion efficiencies, which will minimize the emissions of organics including toxic chlorinated compounds. Proponents are expected to commit to meeting the elements of this policy, and to provide detailed information to support their commitment. The elements of this policy will be enforced by imposing conditions in Certificates of Approval. This policy refers only to the combustion process; additional emissions control and monitoring requirements are addressed in Policy 01-03.		
<u>Point of Contact</u> Director, Air Resources Branch		
<u>Effective Date</u> January 23, 1989		

1. Incineration Temperature

Incinerators shall be designed to be capable of maintaining, on a continuous basis, an incineration temperature of at least 1100°C, and shall operate at a temperature of not less than 1000°C. An auxiliary burner shall be incorporated to provide this minimum operating temperature at start-up before the commencement of the incineration cycle, during shutdown until all combustion of waste has ceased, and when necessary during other phases of operation.

2. Combustion Air Distribution

Primary and secondary combustion air systems on incinerators shall be designed to control air distribution. Control systems shall provide the capability to adjust the distribution of combustion air and to automatically adjust the quantity of combustion air to respond to the range of waste properties, incinerator feedrates, and irregularities in loading and/or burning patterns in the incinerator.

3. Residence Time

Incinerators shall be designed for a combustion gas residence time of not less than one second at 1000°C. This residence time shall be calculated from the point where most of the combustion has been completed and the incineration temperature fully developed.

3.1 In multi-chamber incinerators this residence time shall be calculated from the secondary burner(s) flame front. If air is introduced downstream of the burner flame front, residence time shall be calculated from the final air injection point(s).

3.2 Where the furnace is one continuous space, such as in spreader stoker and single chamber mass burning designs, the location of the

complete combustion/fully developed temperature point shall be determined by an overall design review, and may be significantly downstream of the final air injection point(s).

4. Oxygen Availability

Incinerators shall be designed to provide and shall operate at not less than 6% residual oxygen in the flue gas exhaust during the incineration cycle.

5. Turbulence and Mixing

Incinerators shall be designed to provide and maintain a high degree of gas phase turbulence and mixing in the secondary combustion zone. Provisions shall include any combination of: appropriately located/directed air jets, changes of flue gas flow direction, baffling, and constriction of cross-sectional flue gas flow area.

6. Range of Operation

Incinerators shall be designed to achieve the temperature, residence time, oxygen availability and turbulence requirements of this guideline over the complete expected range of values of the incinerator operating parameters, including:

- feed rate (including minimum and maximum rates);
- ultimate analysis, heating value, ash and moisture content of the waste;
- combustion air; and
- heat losses.

7. Pressure Control and
Emergency Exhaust

Incinerators shall be designed to operate under negative pressure during all phases of operation. Emergency exhausts shall not be located prior to the point at which the one second residence time at 1000°C has been achieved.

8. Control, Monitoring, and
Performance Testing

- 8.1 Incinerators shall incorporate control and monitoring systems to ensure and readily indicate and confirm, that the requirements of this guideline as well as other Ontario Ministry of the Environment standards, regulations and guidelines are consistently met. Control and monitoring systems shall be capable of readily signifying and correcting any aspect of substandard operation.
- 8.2 Continuously monitored parameters shall include temperature(s), total hydrocarbons (or carbon monoxide), and opacity. Monitoring may also be required for oxygen, carbon dioxide, incinerator exhaust flue gas volume, hydrogen chloride, sulphur oxides, nitrogen oxides and other parameters. Continuous monitors shall be equipped with recording devices for subsequent reference and analysis.
- 8.3 Performance tests shall be undertaken within six months of start-up and thereafter at a frequency determined by the Director. The performance test results shall be used to define the acceptable range of feed rates, acceptable operating procedures and an acceptable range of readings for continuous monitoring devices. Any exceedance of this acceptable range for any monitor shall be reported to the local District Office of the Ministry of the Environment.